

### ABSTRACT OF THE DISCLOSURE

The present invention is directed to *in-situ* detection of particles and other such features in an ion implantation system during implantation operations to avoid such additional monitoring tool steps otherwise expended before and/or after

5 implantation, for example. One or more such systems are revealed for detecting scattered light from particles on one or more semiconductor wafers illuminated by a light source (e.g., laser beam). The system comprises an ion implanter having a laser for illumination of a spot on the wafer and a pair of detectors (e.g., PMT or photodiode) rotationally opposite from the ion implantation operations. A wafer

10 transport holds a wafer or wafers for translational scanning under the fixed laser spot. A computer analyzes the intensity of the scattered light detected from the illuminated wafer (workpiece), and may also map the light detected to a unique position. For example, particles or other such contaminates may be identified on wafers during the implantation process before additional time and resources are consumed, and aid in

15 determining the sources of such contaminates. Further, threshold analysis of the quantity or size of such particles, for example, may provide a system interlock for shutdown or feedback control.